Amendment to the Claims:

1. (Presently amended) A hydrogen storage composite material comprising:

a Mg-Ni based alloy; and

a coating of a catalytically active metal deposited directly on at least a portion of a surface of said Mg-Ni based alloy, said coating being less than about 200 angstroms thick;

said composite material capable of adsorbing at least 3 weight percent hydrogen and desorbing at least 1 weight percent hydrogen at 30 °C.

2. (Original) The Mg-Ni composite material of claim 1, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is less than about 150 angstroms thick.

3. (Original) The Mg-Ni composite material of claim 1, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is less than about 100 angstroms thick.

4. (Original) The Mg-Ni composite material of claim 1, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is formed from at least one metal selected from the group consisting of iron, palladium, platinum, iridium, gold, and mixtures or alloys thereof.

5. (Original) The Mg-Ni composite material of claim 4, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is formed from palladium.

6. (Original) The Mg-Ni composite material of claim 5, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is formed from iron.

7. (Original) The Mg-Ni composite material of claim 6, wherein said coating of catalytically active metal deposited on at least a portion of a surface of said Mg-Ni based alloy is formed from both iron and palladium.

8. (Original) The Mg-Ni composite material of claim 1, wherein said Mg-Ni based alloy has a magnesium content which ranges from 40 to 65 atomic percent of the alloy.

9. (Original) The Mg-Ni composite material of claim 8, wherein said Mg-Ni based alloy has a magnesium content which ranges from 45 to 65 atomic percent of the alloy.

10. (Original) The Mg-Ni composite material of claim 1, wherein said Mg-Ni based alloy has a nickel content which ranges from 25 to 45 atomic percent of the alloy.

11. (Original) The Mg-Ni composite material of claim 10, wherein said Mg-Ni based alloy has a nickel content which ranges from 30 to 40 atomic percent of the alloy.

12. (Original) The Mg-Ni composite material of claim 1, wherein said Mg-Ni based alloy further contains manganese and cobalt.

13. (Original) The Mg-Ni composite material of claim 12, wherein said Mg-Ni based alloy has a cobalt content is between 1 and 10 atomic percent of the alloy.

14. (Original) The Mg-Ni composite material of claim 13, wherein said Mg-Ni based alloy has a cobalt content is between 2 and 6 atomic percent of the alloy.

15. (Original) The Mg-Ni composite material of claim 12, wherein said Mg-Ni based alloy has a manganese content is between 1 and 10 atomic percent of the alloy.

16. (Original) The Mg-Ni composite material of claim 15, wherein said Mg-Ni based alloy has a manganese content is between 3 and 8 atomic percent of the alloy.

17. (Original) The Mg-Ni composite material of claim 12, wherein said Mg-Ni based alloy further contains at least one element from the group consisting of Fe, Al, Zr, Zn, Cu, Ag, Cu, B, La, Ru, Re, Li, Cr, Pd, Si, V, Sr, Misch Metal and mixtures or alloys thereof.

18. (Original) The Mg-Ni composite material of claim 17, wherein said at least one element from the group consisting of Fe, Al, Zr, Zn, Cu, Ag, Cu, B, La, Ru, Re, Li, Cr, Pd, Si, V, Sr, Misch Metal and mixtures or alloys thereof is incorporated into the alloy in quantities totaling less than about 5 atomic percent of the alloy for all inclusions and each individual element is incorporated into said alloy in quantities less than about 3 atomic percent.

19. (Original) The Mg-Ni composite material of claim 1, wherein said Mg-Ni based alloy has a two phase structure, including a Mg-rich phase and a Ni-rich phase.

20. (Original) The Mg-Ni composite material of claim 19, wherein said two phase structure includes amorphous structural regions and microcrystalline structural regions.

21. (Original) A hydrogen storage alloy comprising:

an Mg-Ni based alloy;

said alloy having a microstructure including a both a Mg-rich phase and a Ni-rich phase;

said microstructure further including micro-tubes having an inner core of Ni-rich material surrounded by a sheathing of Mg-rich material.

22. (Original) The hydrogen storage alloy of claim 21, wherein said two phase microstructure includes amorphous structural regions and microcrystalline structural regions.

23. (Original) The hydrogen storage alloy of claim 21, wherein said Mg-Ni based alloy has a magnesium content which ranges from 40 to 65 atomic percent of the alloy.

24. (Original) The hydrogen storage alloy of claim 24, wherein said Mg-Ni based alloy has a magnesium content which ranges from 45 to 65 atomic percent of the alloy.

25. (Original) The hydrogen storage alloy of claim 21, wherein said Mg-Ni based alloy has a nickel content which ranges from 25 to 45 atomic percent of the alloy.

26. (Original) The hydrogen storage alloy of claim 25, wherein said Mg-Ni based alloy has a nickel content which ranges from 30 to 40 atomic percent of the alloy.

27. (Original) The hydrogen storage alloy of claim 21, wherein said Mg-Ni based alloy further contains manganese and cobalt.

28. (Original) The hydrogen storage alloy of claim 27, wherein said Mg-Ni based alloy has a cobalt content is between 1 and 10 atomic percent of the alloy.

29. (Original) The hydrogen storage alloy of claim 28, wherein said Mg-Ni based alloy has a cobalt content is between 2 and 6 atomic percent of the alloy.

30. (Original) The hydrogen storage alloy of claim 27, wherein said Mg-Ni based alloy has a manganese content is between 1 and 10 atomic percent of the alloy.

31. (Original) The hydrogen storage alloy of claim 30, wherein said Mg-Ni based alloy has a manganese content is between 3 and 8 atomic percent of the alloy.

32. (Original) The Mg-Ni composite material of claim 27, wherein said Mg-Ni based alloy further contains at least one element from the group consisting of Fe, Al, Zr, Zn, Cu, Ag, Cu, B, La, Ru, Re, Li, Cr, Pd, Si, V, Sr, Misch Metal and mixtures or alloys thereof.

33. (Original) The hydrogen storage alloy of claim 32, wherein said at least one element from the group consisting of Fe, Al, Zr, Zn, Cu, Ag, Cu, B, La, Ru, Re, Li, Cr, Pd, Si, V, Sr, Misch Metal and mixtures or alloys thereof is incorporated into the alloy in quantities totaling less than about 5 atomic percent of the alloy for all inclusions and each individual element is incorporated into said alloy in quantities less than about 3 atomic percent.

34. (Original) The hydrogen storage alloy of claim 21, wherein said microstructure is created by the steps of:

forming a melt of the desired composition of the alloy;

melt quenching said melt onto a chill roller to form melt -quenched alloy ribbons, wherein said melt-quenching parameters are controlled such that said melt-quenched alloy ribbons have a two phase microsrturcture including a Mg-rich phase and a Ni-rich phase;

grinding said melt-quenched ribbons in an attritor to for a sufficient time to:

1) for a powder from said melt-quenched ribbons;

2) form said micro-tubes; and

3) produce a mixture of amorphous structural regions and microcrystalline regions.